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same number found in the Indiana flora, and arranging as before in the order of importance, the result is as follows.

<i>D. C.</i>	<i>Ind.</i>
1. Carex	1. Carex
2. Aster	2. Solidago
3. Panicum	3. Aster
4. Solidago	4. Polygonum
5. Quercus	5. Viola
6. Polygonum	6. Quercus
7. Desmodium	7. Desmodium
8. Salix	8. Helianthus
9. Juncus	9. Salix
10. Viola	10. Juncus
11. Cyperus	11. Panicum
12. Ranunculus	12. Ranunculus
13. Eupatorium	13. Euphorbia
14. Helianthus	14. Cyperus and Potamogeton
15. Asclepias	15. Galium and Scirpus

It will be noted that in the second list *Eupatorium* drops out, appearing in the Indiana flora as No. 25; *Asclepias* also drops out, being No. 20; *Panicum* drops from 3 to 11, and *Viola* rises from 9 to 5. It would seem that *Panicum* is the characteristic genus of the vicinity of Washington, while no single genus can be so ranked in the flora of Indiana, *Helianthus*, *Euphorbia*, *Viola* and several others being equally characteristic.—J. M. C.

Beginning Botany.—I want to tell you a little about my mode of teaching botany to beginners. Before long I will send you a copy of a lecture on this subject.

I set a student on the very start to studying some natural object, as a plant, a seed, a flower, a vine. He is asked to state to the class on the following day what he has discovered. One of the first points is to teach him to see and to become reliable and independent. To acquire this habit he is set to looking. To help him he is often asked to compare two branches of different trees, or two flowers of different species or genera, or two seeds or fruits.

I require students to write out more or less their observations. For this work credit is given, as well as for class recitations. This is not only done in the botany class, but our Professor of the English language, finds such topics among the best he can select for the practice of young students. Many of the essays required are accompanied by drawings which help to explain certain points. As an example of this work, I send a short paper prepared by a member of the Freshman class. It must be remembered that he is a beginner; that he used no books, but went to the plants to get his facts. He had been studying plants for a few weeks. He had been referred to an elementary book for some names. He had received some hints on some points from his teacher while in the class room. Of course, he picked up more or less from his classmates during recitations, in which they spoke of kindred topics:

THE FERTILIZATION OF THE TRUMPET-CREEPER, BY GEORGE SPRANG.—In the bud the calyx of the Trumpet-Creeper is valvate and encloses the other

organs of the flower; the corolla is deeply imbricated, and covers the stamens and pistil.

The anthers of the young flower are very large and of a bright yellow; they are composed of two mealy sacks which are slightly attached together and fall back and nearly cover the filament.

As the flower grows and becomes larger, the anthers become smaller until they are only about one-third of their original size.

In the bud the pistil is already quite tall and has to take a stooping position, but when the flower grows and opens the pistil takes an upright position and always keeps above and out of the reach of the stamens.

Most flowers require crossing, and the arrangement of most of them is such as to prevent self-fertilization and to insure crossing.

The above example is the most common mode by which self-fertilization is prevented, but this plant has other and more striking illustrations of this fact.

The stigma is two-lobed and is so sensitive that if anything touches it, it immediately closes, hence, when the Humming-bird, the principal means by which this plant is fertilized, hovers over the flower and sticks its long proboscis down into the tube its head touches these lobes and they close almost immediately and remain so for a short time.

The anther cells are now open and ready to shed pollen, and as the bird puts its head further down into the tube, it hits these cells and the pollen is dusted upon it, and flying back it hits the pistil again but the stigma is closed and none of the pollen can get in.

But when it goes into the next flower the stigma is open and the pollen is shed upon its lips, sometimes so much as to be plainly seen by the naked eye.

This process is repeated till the bird, tired of the meagre amount of honey it gets for its labors, flies to some other plant hoping for better success.

This plant has an enemy in the black ant which does not enter the flower at the mouth, but eats through the calyx and corolla and sucks the honey which is laid up for the attraction of the birds. Even if the ant did enter at the top and get pollen upon it, it would immediately fall off from its smooth body and legs and thus use up the pollen which would be of no use to the plant in its fertilization.

But the plant's bright and gaudy corolla attracts the birds and even if one does not enter more than two or three flowers, yet it enters enough to scatter the pollen on some pistil and fertilize it.

It has often seemed to me that scientific magazines did not pay enough attention to the best modes of teaching science.

PROF. W. J. BEAL,
Agricultural College, Lansing, Mich.

Quercus heterophylla, Michx.—This tree which for so many years was comparatively unknown, now has its history very well written, yet the number of trees known are very few, and their scarcity has prevented the examination of the wood heretofore, perhaps entirely. The appointment of Prof. Sargent on the department of Forestry in the Census Bureau, has led to the examination of all the species of forest trees in the United States that could be procured. For this purpose I secured a tree of this species, found growing near Mount Holly, Burlington Co., New Jersey, and forwarded to him such portions as he desired; there yet remain in my possession several sections, which I have thought might be desirable for museums and private collections, where specimens of our native woods are kept. I will forward to each as may apply a specimen of this Bartram Oak upon being informed of the dimensions desired.—ISAAC C. MARTINDALE, *Camden, N. J.*